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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/904,112	07/11/2001	Cem Basceri	MIO 0057 PA (98-1070)	1085

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EXAMINER
KENNEDY, JENNIFER M

ART UNIT	PAPER NUMBER
2812	

DATE MAILED: 07/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/904,112	Applicant(s) BASCERI ET AL.	
	Examiner Jennifer M. Kennedy	Art Unit 2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 May 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-106* is/are pending in the application.

4a) Of the above claim(s) *7,13,14,16-21,31-36,51-56,64-72, 80-99 and 106* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-12,15,22-30,37-50,57-63,73-79 and 100-105* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☒ Interview Summary (PTO-413) Paper No(s). 5 .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Claims 1, 4-12, 18, 22-24, 28-39, 43-44, 57-61, 73-76, 100, 104-106 in Paper No. 4 is acknowledged. The election was found to have some errors. For instance, while the examiner notes that the aspect of having the high dielectric constant oxide dielectric material is amorphous when deposited, the applicants' listed claim 7 as being elected. Claim 7 is directed to having a crystalline high dielectric constant oxide dielectric material. Further, some claims that appeared to be within the scope of the elected embodiment, such as claim 2 were not elected. During a telephone interview with Timothy Hagan On May 21, 2002, it was determined that claims 1-6, 8-12, 15, 22-30, 37-50, 57-63, 73-79, and 100-105 should have been elected. An action on the merits of these claims follows.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1-6, 15, 22-30, 37-42, 45-49, 73-79, and 100-105 are rejected under 35 U.S.C. 102(e) as being anticipated by Kunitomo et al. (U.S. Patent No. 6,235,572).

Kunitomo et al. discloses the method of forming a capacitor comprising providing a conductive oxide electrode (RuO_x) (51), depositing a first layer of a high dielectric constant oxide dielectric material (55) on the conductive oxide electrode, oxidizing the conductive oxide electrode and the first layer of the high dielectric constant oxide dielectric material (Ta_2O_5) under oxidizing conditions (see column 18, line 45 through column 19, line 45), depositing a second layer of the high dielectric constant oxide dielectric material (Ta_2O_5) on the first layer of the high dielectric constant oxide dielectric material, oxidizing the second layer of high dielectric constant oxide dielectric material (see column 19, lines 46-58), and then depositing an upper layer electrode (RuO_x) (62) on the second layer of the high dielectric constant oxide dielectric material.

Kunitomo et al. further discloses the method wherein the first high dielectric constant oxide dielectric material is oxidized using a gas plasma (see column 2, lines18-21), and the gas selected form the group consisting of O_2 and O_3, at a temperature form a range of about 250 °C to about 500 °C (see column 18, line 45 through column 19, line 45).

Kunitomo et al. also discloses the method wherein the second layer of high dielectric constant oxide dielectric material is oxidized by rapid thermal oxidation, at a temperature of less than about 700 °C in the presence of a gas selected form the group consisting of O_2 and N_2O conditions (see column 18, line 45 through column 19, line 45).

Kunitomo et al. also discloses the method wherein a field effect transistor (13, 14, 15) having a pair of source/drain regions (22, 23) is provided, electrically connecting one the source drain region with the conductive oxide electrode and the other of said source drain regions with a bit line (BL) (see Figure 35).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 8-12, 43-44, 50, and 57-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunitomo et al. (U.S. Patent No. 6,235,572) in view of Joo (U.S. Patent No. 5,879,957).

Kunitomo et al. discloses the method substantially as claimed, and rejected above, but does not disclose the method of oxidizing the upper layer electrode utilizing gas plasma and a temperature range form about 250 to 500 °C. Joo discloses the method of oxidizing the upper layer electrode utilizing gas plasma (see column 4, lines 46-56). It would have been obvious to one of ordinary skill in the art at the time the invention was made to oxidize the upper electrode by a gas plasma technique in order to avoid a heat treatment at a high temperature.

The selection of the range of temperature is obvious because it is a matter of determining optimum process condition by routine experimentation with a limited

number of species. In re Jones, 162 USPQ 224 (CCPA 1955)(the selection of optimum ranges within prior art general conditions is obvious) and In re Boesch, 205 USPQ 215 (CCPA 1980)(discovery of optimum value of result effective variable in a known process is obvious).

Claims 11-12 and 62-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunitomo et al. (U.S. Patent No. 6,235,572) and Joo (U.S. Patent No. 5,879,957), in view of Kingon et al. (U.S. Patent No. 5,555,486).

Kunitomo et al. and Joo et al. disclose the method substantially as claimed and rejected above, but do not disclose the method of forming a platinum electrode on the upper layer electrode. Kingon et al. discloses the method of forming a platinum electrode upon an upper electrode (see column 6, lines 38-45). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a platinum electrode upon an upper electrode in order to reduce leakage current.

Double Patenting

Applicant is advised that should claims 1-4 be found allowable, claims 73, 77-79 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Kennedy whose telephone number is (703) 308-6171. The examiner can normally be reached on Mon.-Fri. 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on (703) 308-3325. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

jmk
July 12, 2002

John F. Niebling
Supervisory Patent Examiner
Technology Center 2800